<u>WHAT IS CLAIMED IS:</u>

1. An electrode comprising a first electrode material, an adhesion-promoting layer disposed on at least one surface of the first electrode material, and a nanostructure-containing material disposed on at least a portion of the adhesion-promoting layer.

2. The electrode of claim 1, wherein the electrode is a gas discharge device electrode.

3. The electrode of claim 1, wherein the first electrode material is molybdenum.

4. The electrode of claim 4, wherein the adhesion promoting interlayer has a thickness of approximately 10-1,000 nm.

5. The electrode of claim 1, wherein the adhesion-promoting layer comprises a metallic material.

6. The electrode of claim 1, wherein the adhesion-promoting layer comprises a carbon-dissolving, carbide forming, or low melting point material.

7. The electrode of claim 5, wherein the metallic material comprises: Ni, Co, Fe, Si, Mo, Ti, Ta, W, Nb, Zr, V, Cr, Hf, Al, Sn, Cd, Zn, or Bi.

8. The electrode of claim 1, wherein the nanostructure-containing material comprises carbon nanotubes.

9. The electrode of claim 8, wherein the carbon nanotubes comprise single-walled carbon nanotubes.

10. The electrode of claim 1, wherein the nanostructure-containing material is formed from: carbon, silicon, germanium, aluminum, silicon oxide, germanium oxide, silicon carbide, boron, boron nitride, boron carbide, or a mixture thereof.

11. The electrode of claim 1, wherein the electrode is annealed.

12. The electrode of claim 1, wherein the electrode has a turn-on voltage required to produce an emitted electron current of approximately 1μA over an emission area of approximately 2.8cm^2 of approximately 1.2V/micron - 2.5V/micron.

13. The electrode of claim 1, wherein the electrode has a critical electric field of approximately 1.7 V/micron - 3.0 V/micron to produce a current density of approximately $1 mA/cm^2$.

14. The electrode of claim 8, wherein the nanostructure-containing material covers the entire adhesion-promoting layer.

15. A gas discharge device comprising a sealed chamber containing at least one noble gas and a plurality of spaced electrodes, at least one electrode comprising a first electrode material, an adhesion-promoting layer disposed on at least one surface of the first electrode material, and a nanostructure-containing material disposed on at least a portion of the adhesion-promoting layer.

16. The device of claim 15, wherein the first electrode material is molybdenum.

17. The device of claim 15, wherein the adhesion promoting layer has a thickness of approximately 10-1,000 nm and the nanostructure-containing layer has a thickness of approximately 1-100 μm.

18. The device of claim 15, wherein the adhesion-promoting layer comprises a metallic material.

19. The device of claim 15, wherein the adhesion-promoting layer comprises a carbon-dissolving, carbide forming, or low melting point material.

20. The device of claim 18, wherein the metallic material comprises Ni, Co, Fe, Si, Mo, Ti, Ta, W, Nb, Zr, V, Cr, Hf, Al, Sn, Cd, Zn, or Bi.

21. The device of claim 15, wherein the nanostructure-containing material comprises single-walled carbon nanotubes.

22. The device of claim 15, wherein the electrode is annealed.

23. The device of claim 15, wherein the electrode has a turn-on voltage required to produce an emitted electron current of approximately 1μA over an emission area of approximately 2.8cm^2 of approximately 1.2V/micron - 2.5V/micron.

24. The device of claim 15, wherein the electrode has a critical electric field of approximately 1.7 V/micron - 3.0 V/micron to produce a current density of approximately 1mA/cm^2.

25. The device of claim 21, wherein the nanostructure-containing material covers the entire adhesion-promoting layer.

26. The device of claim 15, wherein each of the plurality of electrodes comprise the first electrode material, the adhesion- promoting layer disposed on at least one surface of the first electrode material, and the nanostructure-containing material disposed on at least a portion of the adhesion-promoting layer.

27. The device of claim 15, wherein the spaced electrodes define a separation distance of approximately 0.1-1.0 mm.

28. The device of claim 27, wherein the separation distance is approximately 1 mm.

29. The device of claim 27, wherein the separation distance is created by a ceramic spacer.

30. The device of claim 15, wherein the sealed chamber contains at least one inert gas at a pressure of 0.5-800 torr.

31. The device of claim 30, wherein the sealed chamber contains argon gas at a pressure of approximately 0.5 torr.

32. The device of claim 15, wherein the device exhibits a mean breakdown voltage of approximately 448.5V with a standard deviation of 4.58V measured over 100 surges.

33. The device of claim 15, wherein the device exhibits a breakdown voltage of approximately 400V after being exposed to 1000 surges.

34. A circuit comprising at least one of an interface device box and a central office switching gear, the circuit further comprising at least one gas discharge device as set forth in claim 15.

35. A telecommunications network comprising a gas discharge device as set forth in claim 15.

36. The network of claim 35, further comprising at least one of an interface device box and a central office switching gear.

37. The network of claim 35, wherein the network comprises an asymmetric digital subscriber line.

38. The network of claim 35, wherein the network comprises a high-bit-rate digital subscriber line.

39. A lighting device comprising a sealed chamber containing an excitable gas and at plurality of spaced electrodes, at least one of said electrodes comprising a first electrode material, an adhesion-promoting layer disposed on at least one surface of the first electrode material, and a nanostructure-containing material disposed on at least a portion of the adhesion-promoting layer.

40. The lighting device of claim 39, wherein the nanostructure-containing material comprises single-walled carbon nanotubes.

41. The lighting device of claim 40, wherein the adhesion-promoting layer comprises a carbon-dissolving, carbide forming, or low melting point material.

42. A method of providing a gas discharge device with smaller variances in mean breakdown voltage, increased breakdown reliability, smaller electron emission turn-on requirements, and stable electron emission at high current density, the gas discharge device comprising a sealed chamber containing at least one noble gas and a plurality of spaced electrodes, the method comprising:

applying an adhesion-promoting layer to a surface of at least one of the plurality of electrodes; and

applying a layer of nanostructure-containing material on to at least a portion of the adhesion-promoting layer.

43. The method of claim 42, further comprising the step of annealing the coated electrode.

44. The method of claim 43, wherein the step of annealing is carried out over a period of approximately 0.5 hr. at a pressure of approximately 5×10^{-6} Torr at a temperature of approximately 650-1150°C.

45. The method of claim 42, wherein the nanostructure-containing material comprises single-walled carbon nanotubes.

46. The method of claim 42, wherein the adhesion-promoting layer comprises a carbon-dissolving, carbide forming or low melting point material.

47. The method of claim 46, wherein the adhesion-promoting layer comprises: Ni, Co, Fe, Si, Mo, Ti, Ta, W, Nb, Zr, V, Cr, Hf, Al, Sn, Cd, Zn, or Bi.

48. The method of claim 42, wherein the method comprises applying the adhesion-promoting layer and nanostructure-containing layer to each of the plurality of electrodes.

49. The method of claim 42, wherein the nanostructure-containing material coves the entire adhesion-promoting layer.

50. The method of claim 42, wherein the adhesion-promoting layer has a thickness of approximately 10-100 nm and the nanostructure-containing layer has a thickness of approximately 1-100 μm.

51. The method of claim 42, wherein the at least one electrode is formed of molybdenum.